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Neurocysticercosis – Clinical and Radiological Appraisal from a Tertiary Centre of Bihar, India

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Abstract
Little has been published on Neurocysticercosis (NCC) in the State of Bihar, India. This study was conducted to describe the clinical and radiological features of NCC.
Materials: *Fifty patients of NCC presenting in department of medicine, PMCH, Patna were evaluated on preset proforma containing detailed demographic data, dietary habits, clinical features and neuroimaging findings.*
Results: *Out of 50 patients of NCC, 28 (56%) were male with most common age group being 21-30 years (36%). Seizure only is the most common presentation followed by seizure with increased intracranial pressure (70 and 14% respectively). Other presentation are seizure with psychotic symptoms, meningoencephalitis and ICSOL. CSF is inflammatory in 50% and ELISA is positive in 30 (60%). Multiple ring enhancing lesions either alone or in combination were seen on computerised tomography scans in 28 (56%) cases and parietal lobe involvement is the commonest site.*
Conclusions: *NCC is common public health problem in Bihar and one of the common cause of seizure. High level of suspicion is of paramount importance for diagnosis so that appropriate treatment can be started.*
Keywords: *Bihar, ELISA, NCC, neuroimaging, seizure.*

Introduction

Cysticercosis, the infection caused by larval stage of tapeworm Taenia *solium*, is the most common parasitic disease of nervous system in human and single most common cause of acquired epileptic seizure in developing world[1]. Cysticerci have a predilection for migrating to the central nervous system (CNS), eyes and striated muscle. When cysticercosis affects CNS or eye it is called neurocysticercosis (NCC). Its prevalence varies greatly according to the geographical region and is not yet precisely known. This study was carried out to describe the clinical and radiological features of NCC in state of Bihar, India.

Material and Methods

The present prospective study was conducted in department of medicine, Patna Medical College,

Patna. Fifty patients were included in this study. The diagnosis of neurocysticercosis (NCC) was made on the basis of following criteria-

1) CT finding of single/multiple, low/high attenuating lesion, disc or ring enhancing lesion with compressed ventricle
2) ELISA test for cysticercosis antibody in serum.
3) CSF examination

All patients of NCC were evaluated clinically on preset proforma and subjected to routine haematological and biochemical investigations. CSF examination for biochemical and cytology with particular reference to eosinophil was done. Plain and contrast cranial CT was done in all cases. ELISA for cysticercus antibody was done.

Observations

Out of 50 patients of NCC, 28 (56%) were male with most common age group being 21-30 years (36%). Seizure only is the most common presentation followed by seizure with increased intracranial pressure (70 and 14% respectively). Other presentation are seizure with psychotic symptoms, meningoencephalitis and ICSOL (table 1). Hyperreflexia (8,16%), papilloedema (5,10%), disorientation, nuchal rigidity are common signs. Most common seizure pattern were partial seizure with secondary generalisation (25, 55.5%) followed by generalized tonic clonic seizure (table 2). Table 3 shows haematological and CSF findings. ELISA for NCC is positive in 30 (60%) patients and CSF is inflammatory in half of cases. Fifteen (30%) presented with ring enhancing lesion alone and 13(26%) patients with ring enhancing lesion in combination, together they constituted maximum number of cases. Equally common was pin head hyper attenuated lesion found in 8 (16%) and in combination in 19(38%) patients. Most common site of lesion was parietal lobe (table 4)

Table 1: Sign and symptoms of NCC

Symptoms	Number	Percent
Epilepsy	45	90
Headache	12	24
Nausea± vomiting	10	20
Altered sensorium	04	08
Psychiatric features	04	08
Visual disturbance	05	10
fever	03	06
Sign		
Nuchal rigidity	3	06
Papilloedema	05	10
Hyperreflexia	08	16
Ataxia	03	06
Disorientation	05	10

Table 2: Clinical seizure pattern

Seizure pattern	Number	Percent
Generalised tonic-clonic (GTCS)	18	40
Simple partial	2	4.5
Partial seizure with secondary generalisation	25	55.5

Table 3: Haematological and CSF finding in NCC

Investigation	Number	Percent
Blood		
Peripheral leucocytosis	15	30
Peripheral eosinophilia	10	20
CSF		
Inflammatory CSF	25	50
Non inflammatory CSF	25	50
Eosinophil in sediment	5	10
Serum ELISA		
POSITIVE	30	60
NEGATIVE	20	40

Table 4: Site of lesion on CT Scan

Site of lesion	Number
Frontal lobe	20
Parietal lobe	40
Temporal lobe	10
Occipital lobe	25
Cerebellum	05

Discussion

Neurocysticercosis is one of the most serious problem of public health in developing nation. It has varied clinical presentation. In this study, maximum number (36%) of patients were encountered in age group of 21 to30 years and approximately 80 % patents belongs to 11-40 years group. Verma A and Gaur KJ[2] from Uttaranchal reported that majority of cases were in

the 21-30 age group. Male outnumbered female (M:F:: 1.27:1). According to Arseni and Sarnitca[3], 37 were males(59.6%) and 40.2% were female.

Seizure was the most common (45pts, 90%) presentation in our study. Seizure was the lone presentation in 35 (70%) of cases. Incidence of seizure was found in 50-55% in the reports available from outside India[4,5] whereas incidence varies from 59-94% in studies reported from India[6,7]. In this study partial seizure with secondary generalization was present in 25(55.5%) and is the commonest seizure type. Trelles and Trelles[8], Sotelo et al[4] found partial seizure with secondary generalization to be the commonest clinical presentation. Second most common seizure type is generalized tonic- clonic (18, 40%). Kuruvilla et al[9] reported generalized seizure as a presenting symptoms in 36% cases. Feature of raised intracranial tension was present in (7 pts, 14%). Mukherjee et al[10] in a study of 30 cases reported an incidence of raised intracranial tension in 19% cases.

Seizure was the most common symptoms followed by headache (12,24%), nausea/ vomiting in 10(20%). Sotelo et al.[4] observed headache in 43.4% and nausea/vomiting in 27.2%. Among the signs, hyperreflexia (16%) and disorientation (10%) were the commonest. Sotelo et al[4] observed hyperreflexia in 21% and bilateral papilledema in 28%. Svetlana Agapejev[11] reported hyperreflexia in 13(59.1%) and bilateral papilledema in 17 (73%) cases. Discrepancies in the incidence of signs and symptoms in our study as compared to others may be due to less number of patients in this study.

Perirpheral blood smear examination revealed leukocytosis in 15(30%) cases and peripheral eosinophilia in 10 pts (20%). Mccormick et al[5] reported leukocytosis in 10% and eosinophilia in 3.1% cases where as Grisolia[12] et al reported in 35 and 17.6% cases respectively. CSF was inflammatory in 50% cases. Sotelo et al[4] observed that when CSF is inflammatory 80% cases show eosinophil. Grisolia et al[12] reported eosinophilia in CSF in 20% cases. CT scan is helpful not only in suspecting the etiology but also in finding the number, localization and extent of lesion. In our study of 50 patients, 15(30%) presented with ring enhancing lesion alone and 13(26%) patients with ring enhancing lesion in combination, together they constituted maximum number of cases. Equally common was pin head hyper attenuated lesion found in 8 patients (16%) and in combination in 19 patients (38%). Bhatia [13]in a series of 20 patients of NCC found 7 cases with ring enhancing lesion alone and 6 patients in combination. Majority of ring lesion either isolated or in combination measured 5-10 mm whereas pinhead and calcified lesion lesion were <5 mm in size. Bhatia reported similar finding regarding size of lesions. In our series, parietal lobe involvement was the commonest site (90%) whereas frontal lobe was affected in 25(50%). Majority of patients had also shown perifocal edema. Extensive edema frequently seen with NCC helps to distinguish it from cerebritis, small abscesses or metastasis.

Conclusion

Neurocysticercosis is one of the most serious public health problems and it has varied clinical presentation, seizure being the most common. Features of raised intracranial tension, psychotic behavior, meningoencephalitis and intracranial space occupying lesion are other presentation. Most commonly affected age group is 11-40 years. Peripheral leucocytosis and eosinophilia are found in small number of patients. Parietal site is most common site of involvement and ring enhancing lesion is the commonest CT finding. High level of suspicion is of paramount importance for diagnosis so that appropriate treatment can be started.

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Ethical Clearance: Taken

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